

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

Listing of Claims

Claims 1-8 (Canceled)

Claim 9 (Currently amended): A method of producing a grid for a battery electrode plate, comprising the steps of:

providing a sheet to become the grid for the battery electrode plate;

providing a rotary expander, and

forming the grid from the sheet by the rotary expander, wherein said rotary expander comprises a disk cutter cluster comprising:

a first disk cutter roll having a first middle disk cutter;

a second disk cutter roll having a second middle disk cutter, the first disk cutter roll and the second disk cutter roll being a pair;

an edge disk cutter at an outermost end of said disk cutter cluster; wherein the edge disk cutter comprises;

a first face facing the second middle disk cutter;

a second face opposite to the first face;

ridges disposed at a periphery of said edge disk cutter, wherein a notch is interposed between the ridges ~~being adjacent,~~

wherein the notch is provided at the periphery of said edge disk cutter by penetrating said edge disk cutter in the thickness direction of said edge disk cutter; and

an inclined surface provided on the ridges having a tip having an acute angle on the first face ~~on the second face of the ridges~~, wherein said notch is provided to serve as an edge node forming part.

Claim 10 (Previously presented): The method of producing a grid for a battery electrode plate according to Claim 9,

wherein each of said ridges protrude by 30% or greater of the thickness of said sheet from a reference plane of said disk cutter cluster.

Claim 11 (Previously presented): The method of producing a grid for a battery electrode plate according to Claim 10,

wherein each of said ridges protrude by 70% or greater of the thickness of said sheet from said reference plane.

Claim 12 (Previously presented): The method of producing a grid for a battery electrode plate according to Claim 9,

wherein the height of protrusion of each of said ridges from a reference plane of said disk cutter cluster is 110% or less of the thickness of said sheet.

Claim 13 (Previously presented): The method of producing a grid for a battery electrode plate according to Claim 9,

wherein a bottom part of said notch is positioned on the second disk cutter roll equipped with said edge disk cutter against a reference plane of said disk cutter cluster.

Claims 14-15 (Canceled)

Claim 16 (Previously presented): A method of producing a lead-acid battery, comprising the steps of:

providing a sheet to become a grid for a battery electrode plate;

providing a rotary expander; and

forming the grid from the sheet by the rotary expander, wherein said rotary expander comprises a disk cutter cluster comprising:

a first disk cutter roll having a first middle disk cutter;

a second disk cutter roll having a second middle disk cutter, the first disk cutter roll and the second disk cutter roll being a pair;

an edge disk cutter disposed at an outermost end of said disk cutter cluster;

wherein the edge disk cutter comprises

a first face facing the second middle disk cutter;
a second face opposite to the first face;
ridges disposed at a periphery of said edge disk cutter,
wherein a notch is interposed between the ridges ~~being adjacent~~,
wherein the notch is provided at the periphery of said edge disk
cutter by penetrating said edge disk cutter in the thickness direction
of said edge disk cutter; and
an inclined surface provided on the ridges having a tip
having an acute angle on the first face ~~on the second face of the~~
~~ridges~~, and wherein said notch is provided to serve as an edge node
forming part.

Claim 17 (Previously presented): The method of producing a lead-acid battery according
to Claim 16,

wherein each of said ridges protrude by 30% or greater of the thickness of said sheet from
a reference plane of said disk cutter cluster.

Claim 18 (Previously presented): The method of producing a lead-acid battery according
to Claim 17,

wherein each of said ridges protrude by 70% or greater of the thickness of said sheet from
said reference plane.

Claim 19 (Previously presented): The method of producing a lead-acid battery according to Claim 16,

wherein the height of protrusion of each of said ridges from a reference plane of said disk cutter cluster is 110% or less of the thickness of said sheet.

Claim 20 (Previously presented): The method of producing a lead-acid battery according to Claim 16,

wherein a bottom part of said notch is positioned on the second disk cutter roll equipped with said edge disk cutter against a reference plane of said disk cutter cluster.

Claims 21-22 (Canceled)

Claim 23 (Withdrawn): An apparatus for producing a grid for a battery electrode plate comprising:

- a disk cutter cluster comprising a pair of disk cutter rolls;
- a middle disk cutter disposed in each of said disk cutter rolls;
- an edge disk cutter disposed at an edge of said disk cutter cluster;
- a notch provided at the periphery of said edge disk cutter and penetrating said edge disk cutter in the thickness direction of said edge disk cutter;
- a ridge disposed at the periphery of said edge disk cutter; and

an inclined surface of said edge disk cutter that contacts with said ridge at least at a part of contact with said notch,

wherein said notch is formed at an edge node forming part.

Claims 24-25 (Canceled)

Claim 26 (Withdrawn): The apparatus for producing a grid for a battery electrode plate according to Claim 23,

wherein said ridge protrudes by 30% or greater of the thickness of said sheet from a reference plane of said disk cutter cluster.

Claim 27 (Withdrawn): The apparatus for producing a grid for a battery electrode plate according to Claim 26,

wherein said ridge protrudes by 70% or greater of the thickness of said sheet from said reference plane.

Claim 28 (Withdrawn): The apparatus for producing a grid for a battery electrode plate according to Claim 23,

wherein the height of protrusion of said ridge from a reference plane of said disk cutter cluster is 110% or less of the thickness of said sheet.

Claim 29 (Withdrawn): The apparatus for producing a grid for a battery electrode plate according to Claim 23,

wherein a bottom part of said notch is positioned on the side of a disk cutter roll equipped with said edge disk cutter against a reference plane of said disk cutter cluster.